operations of the electronic device can be controlled by touching the activation areas of the display. The touch sensitive display also comprises a display area in which information used in mobile stations, such as telephone numbers, can be shown. In connection with the touch sensitive screen, there is provided a rigid cover arranged as movable with a hinge, which can be turned in a closed position over the touch sensitive display. In apertures made in the cover, there are also arranged mechanical activation elements, or keys, so that when the activation elements are depressed when the cover is in the closed position, they touch the activation areas of the touch sensitive display and thus transmit the depression to the display for activating the functions of the device. The electronic device presented in the U.S. Pat. No. 5,584,054 operates as a mobile station when the cover is in the closed position. The electronic device also operates as a PDA device when the cover is in the opened position, whereby the operations of the electronic device can be controlled by touching the activation areas of the display directly with a finger or a pointed object resembling a pen. When the cover is in the opened position, depressing the keys has no effect, because in this position of the cover the movement of the keys does not extend to the touch sensitive screen. The hinge of the cover of the electronic device is provided with a switch, which recognizes the position of the cover and controls the operation of the electronic device. The cover also functions as a protective cover for the touch sensitive display. The prior art technology also provides mobile stations with a rigid, level, non-transparent cover, which protects the keyboard disposed in the body of the mobile station and which can be opened and closed. The cover is often provided with an opening, through which the display or display area of the mobile station can be read. Often the cover also includes the microphone of the mobile station, whereby the cover must be opened for the duration of the phone call.

[0011] In an electronic device according to the invention described above it is not possible to use the keyboard and the whole display at the same time. When the cover is closed for using the keyboard, only a small portion of the possible display area is available for use. When a part of the display area is reserved as activation areas, it is not possible to present as much information on the display as in electronic devices with a separate keyboard and a display. When the cover of the electronic device is open and the electronic device is used by means of the touch-screen display, the whole display area is still not in use, because part of the display area is reserved as activation areas. In addition, it is difficult for the user to get any other feedback from pressing the activation area than possible changes on the display.

SUMMARY OF THE DISCLOSED EMBODIMENTS

[0012] The aspects of the disclosed embodiments provide an electronic device in which the whole display area and keyboard are available for use at the same time. In one aspect this can be achieved by implementing the keyboard instead of the display as a separate element which can be exposed by sliding or turning. In another aspect, the disclosed embodiments are directed to an electronic device, in which the keyboard interface is much simpler than in the conventional solution. In one embodiment, this can be achieved by implementing the keyboard by means of a touch sensitive element. A third aspect of the disclosed embodiments is to provide a keyboard of an electronic device, which gives the user immediate feedback for the success of the depression of a key. In one embodiment, this can be achieved by placing a conventional keyboard mat or membrane over the touch sensitive element. A fourth aspect of the disclosed embodiments is to provide a keyboard element of an electronic device, which would be considerably thinner compared to the prior art solutions. In one embodiment, this can be achieved by implementing the keyboard by means of a touch sensitive element.

[0013] The disclosed embodiments provide considerable advantages as compared to the prior art solutions. When the electronic device has a keyboard disposed in a separate element, which is exposed by sliding or turning, it is not necessary to reserve certain areas of the display as activation areas for the keyboard, but the entire display area is available for displaying the information to be presented. When the keyboard is implemented with a touch sensitive element, the interface between the keyboard and the body of the electronic device becomes much simpler, and the number of I/O (input/output) signals can be reduced to two at the best, whereby the construction becomes much simpler, cheaper and less vulnerable to damage. When a prior art keyboard mat has been installed on the touch sensitive element, the user receives a good feedback when depressing a key, which is a very important property of a user interface. Especially people with large fingers will find it much easier to use the small keys of mobile stations correctly, if the user has a good tactile feel of the keyboard. A good tactile feel can be provided for the user by using a keyboard mat similar to the conventional type on top of the touch sensitive element.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] In the following, the invention will be described in more detail with reference to the accompanying drawings, in which

[0015] FIG. **1** shows an electronic device according to a preferred embodiment, in which the keyboard is implemented in an element which slides out.

[0016] FIG. **2** shows an electronic device according to FIG. **1** seen from above and the keyboard element as pushed into the body of the device,

[0017] FIG. **3** shows an electronic device according to FIG. **1** as seen from the section A-A.

[0018] FIG. **4** shows a schematic diagram of the electronic device and a preferred implementation of the touch sensitive element,

[0019] FIG. **5** shows an electronic device according to a preferred embodiment of the invention, in which the exposable keyboard is implemented in a turning element.

[0020] FIG. **6** shows the electronic device according to FIG. **5** seen from above and the keyboard element in the closed position.

DETAILED DESCRIPTION OF THE DISCLOSED EMBODIMENTS

[0021] A keyboard of an electronic device according to the invention can be used, for example, in PDA devices, portable computers and mobile stations. In this specification, a mobile station is used as an example of an electronic device. FIG. **1** shows a mobile station **1** according to the invention, which comprises a keyboard element **3** and a body housing element **2**, the front panel **2***a* of which includes a display **5**, a microphone **6**, an earphone **7** and possibly one or more function keys **8**. It is clear that, for instance, some of the function keys